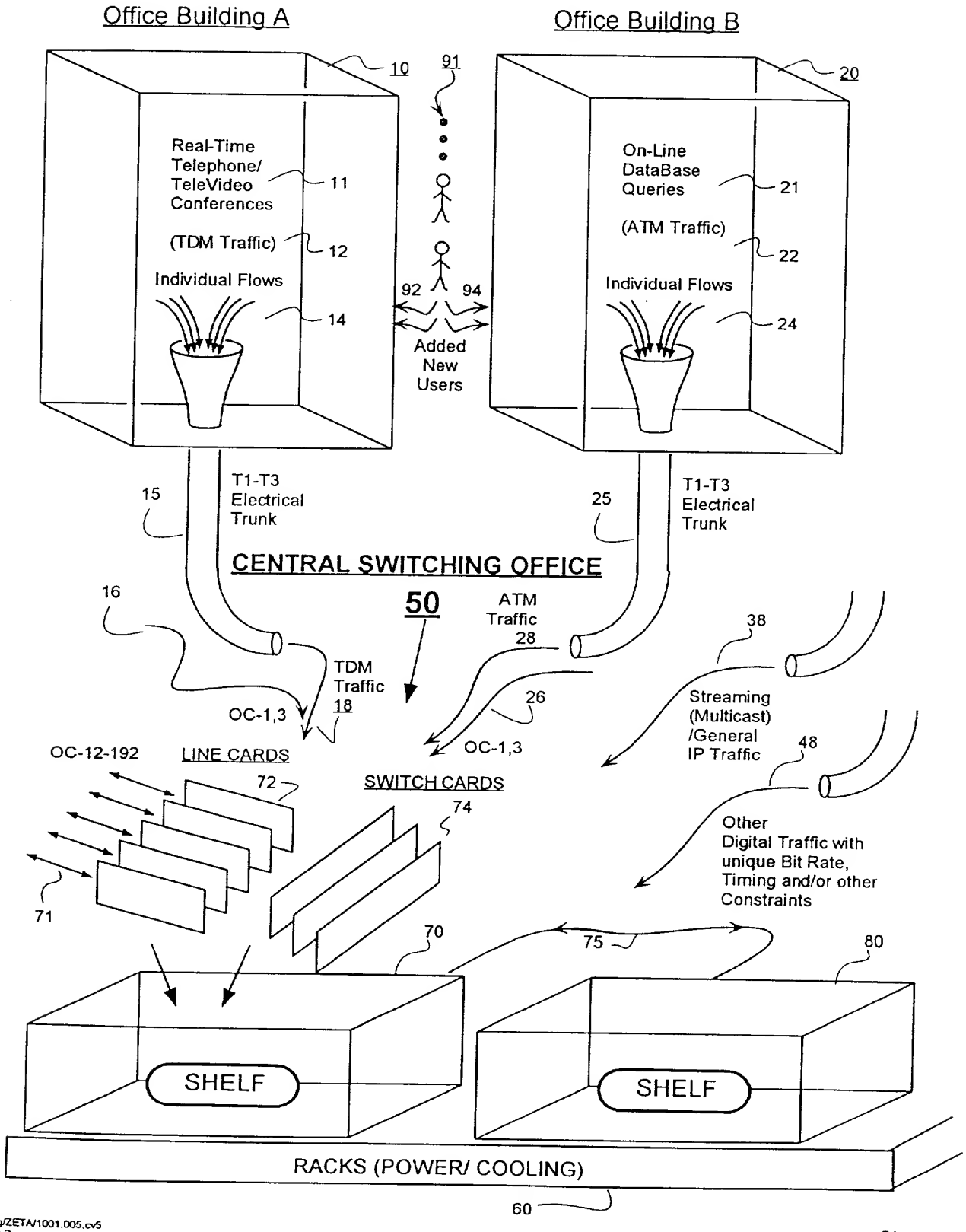
Applicant: Onchuen (Daryn) Lau et al.
Title: Multiservice Switching System
With Distributed Switch Fabric
Atty Docket No.: ZETTA-01001US0GGG

90

Fig. 1A



Applicant: Onchuen (Daryn) Lau et al.

Title: Multiservice Switching System
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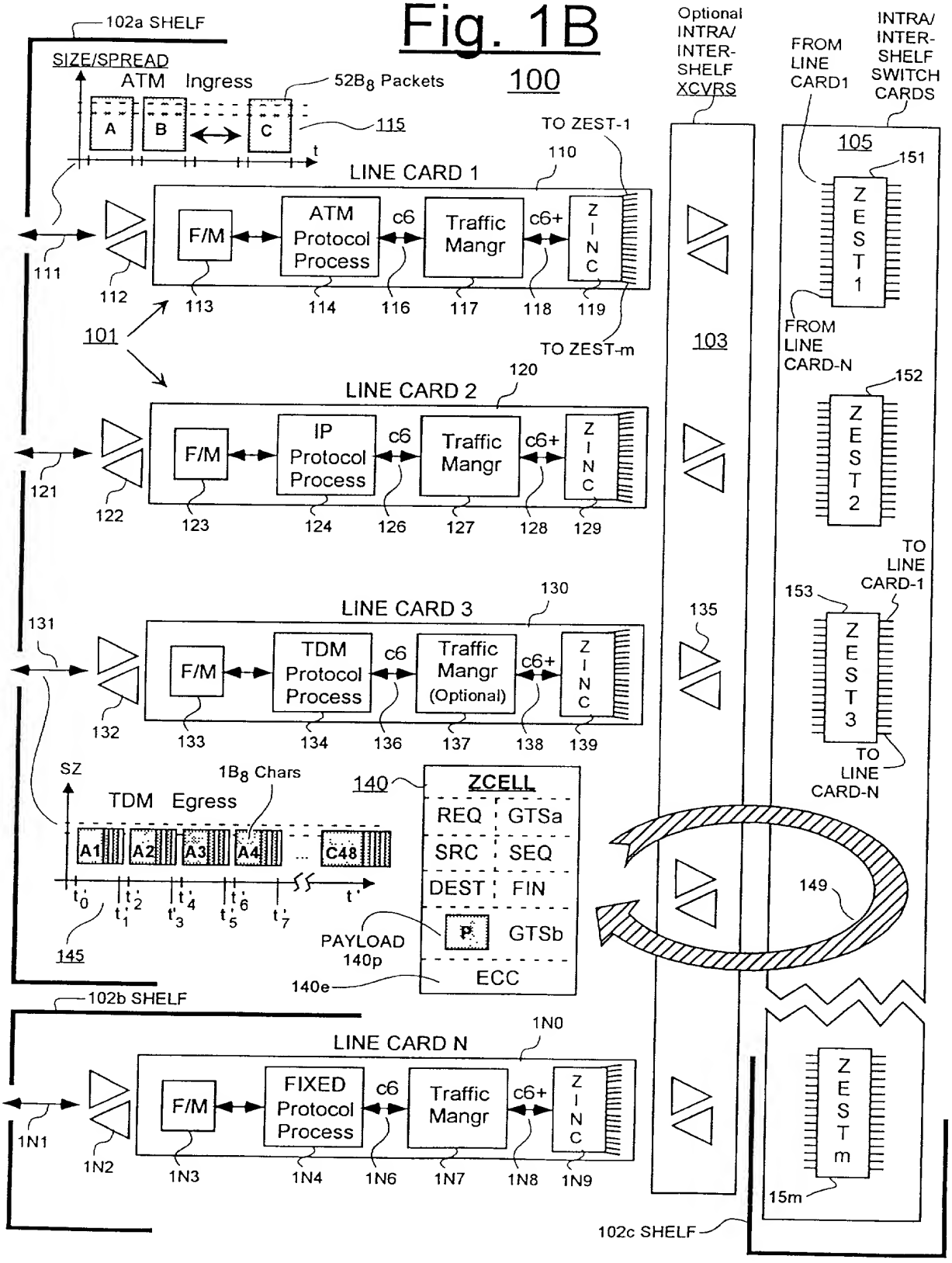
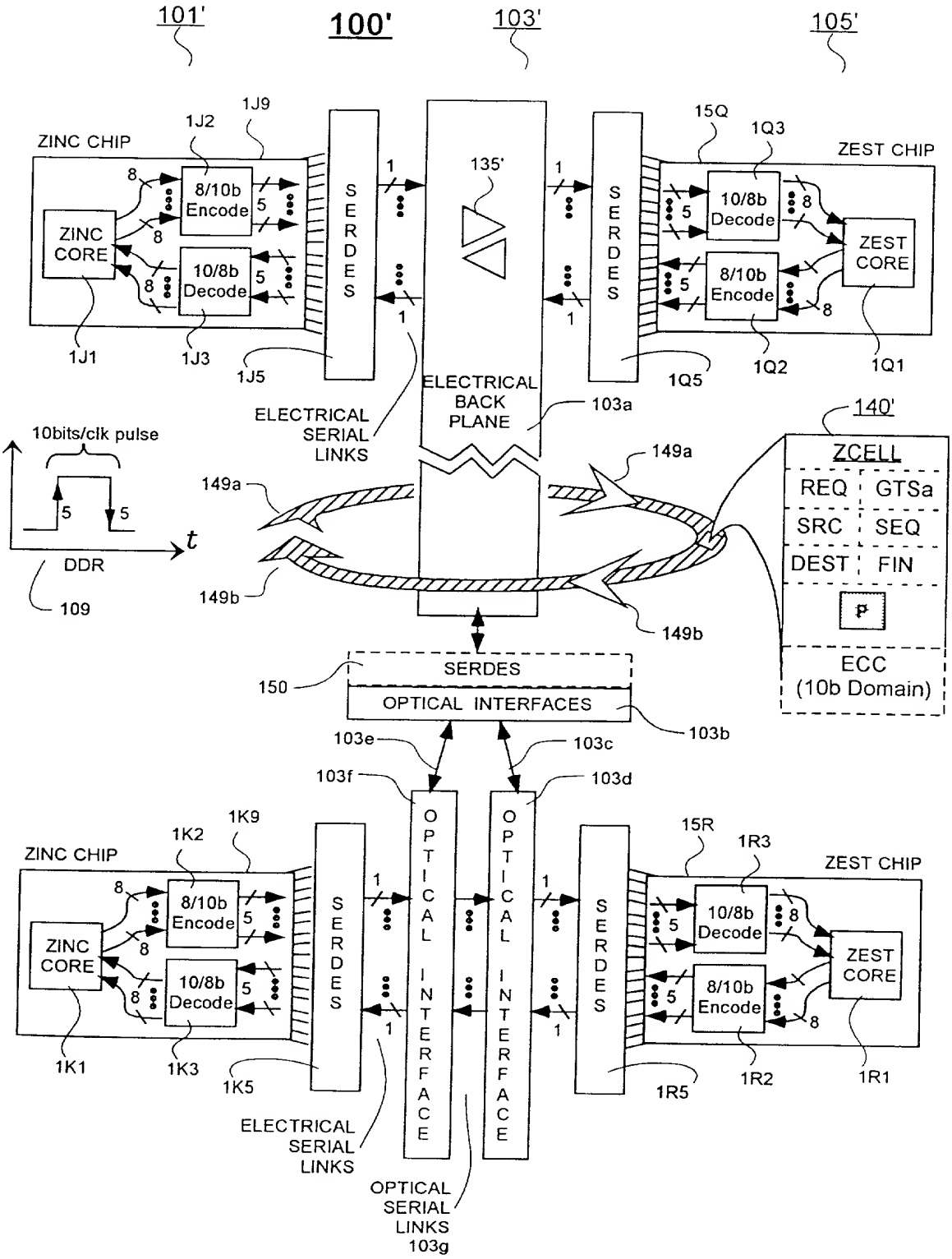
Atty Docket No : ZETTA-01001US0GGG

Fig. 1B



09/674,760 PCT/US99/07691

Fig. 1C


101'
100'
103'
105'
ZINC CHIP
1J2
1J9
8/10b Encode
10/8b Decode
ZINC CORE
SERDES
135'
15Q
1Q3
ZEST CHIP
10/8b Decode
8/10b Encode
ZEST CORE
1J1
1J3
1J5
1Q5
1Q2
1Q1
ELECTRICAL SERIAL LINKS
ELECTRICAL BACK PLANE
103a
140'
ZCELL
REQ
GTSa
SRC
SEQ
DEST
FIN
P
ECC (10b Domain)
10bits/clk pulse
DDR
109
149a
149b
SERDES
OPTICAL INTERFACES
150
103b
103e
103c
103f
103d
OPTICAL INTERFACE
15R
1R3
1K2
1K9
1K1
1K3
1K5
1R5
1R2
1R1
OPTICAL SERIAL LINKS
103g

ZETTA-01001US0GGG

Fig. 2
200

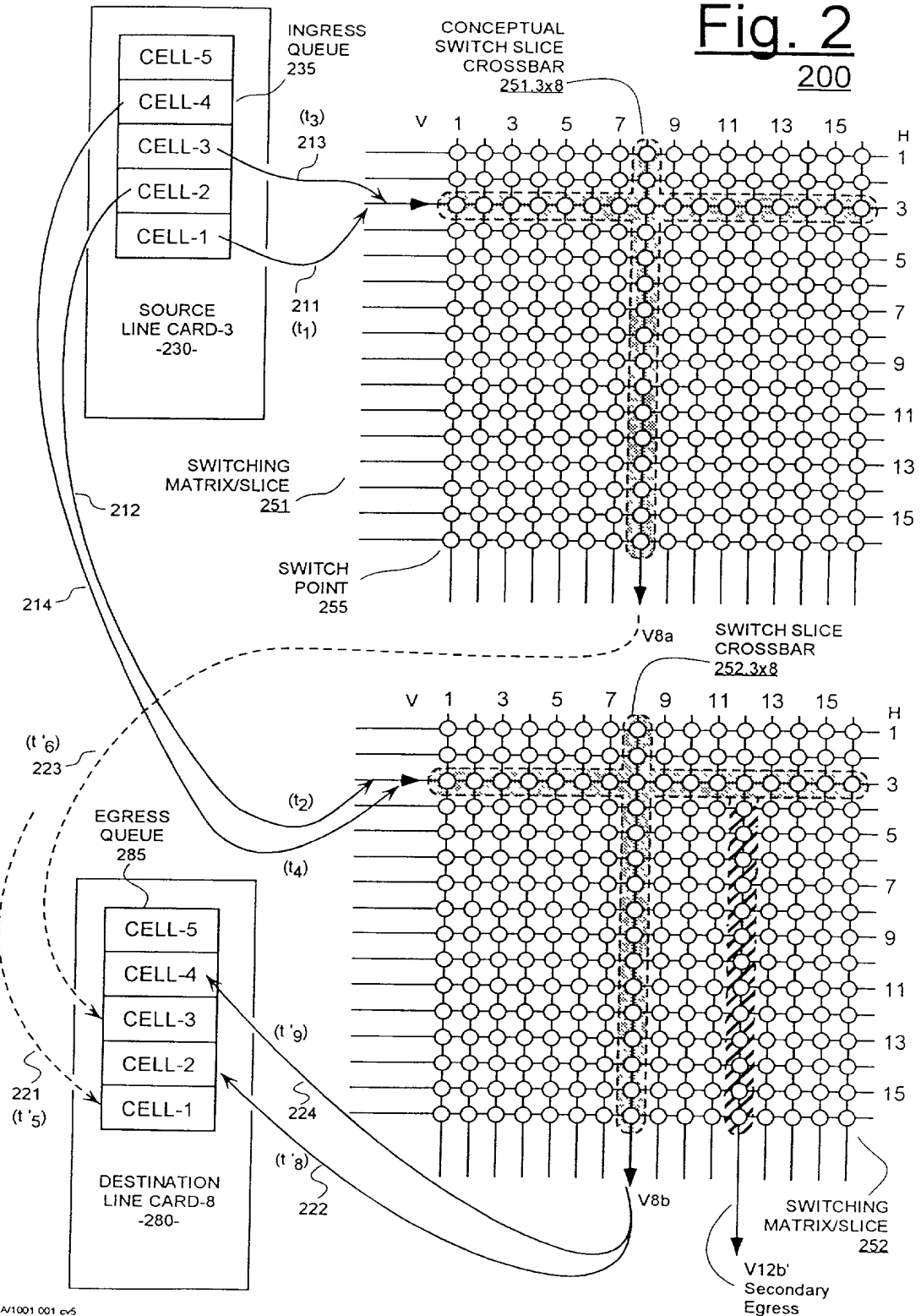
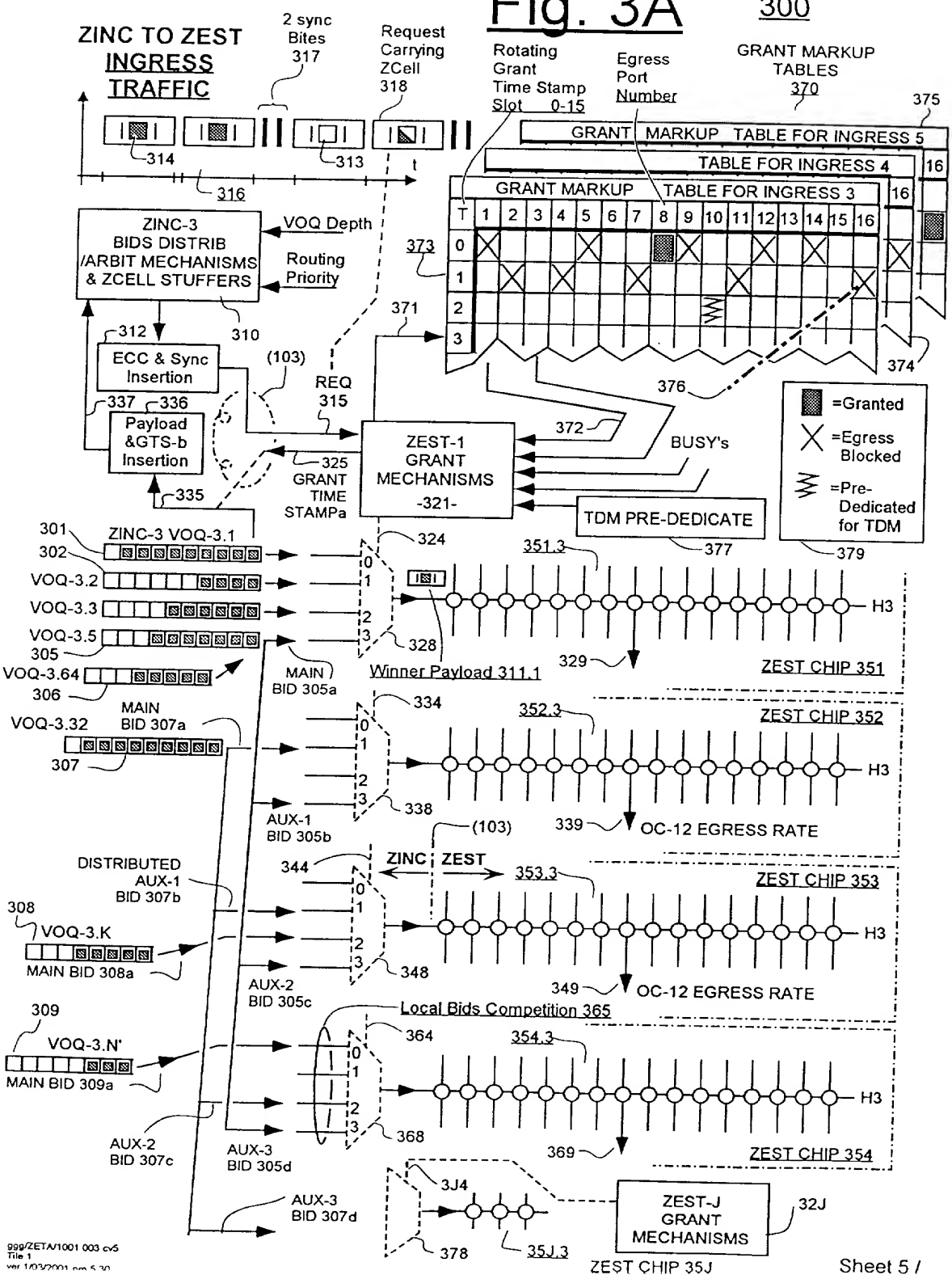


Fig. 3A



Sheet 5 /

FOR EXAMINATION PURPOSES

Fig. 3B

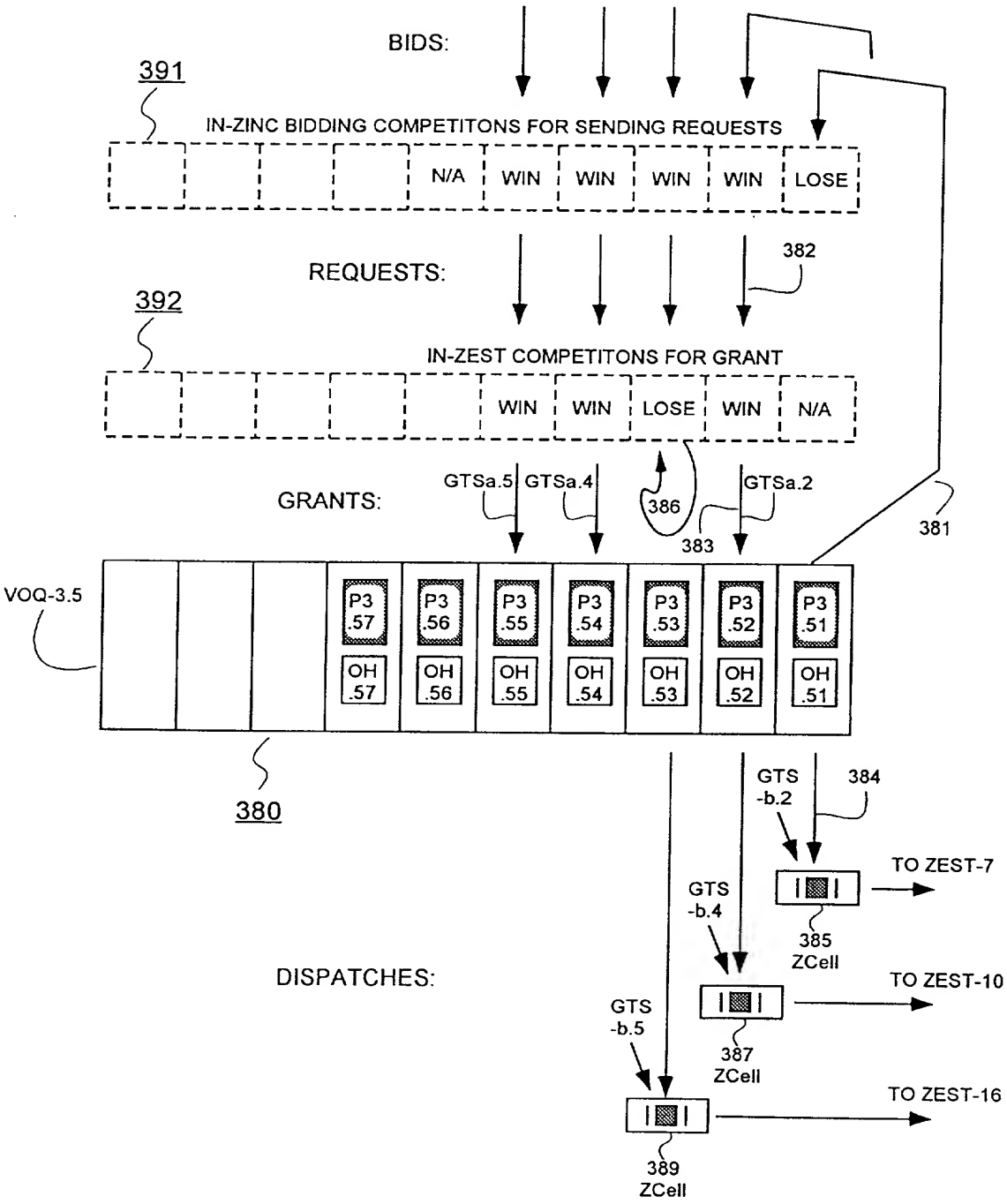

BIDS:
391
IN-ZINC BIDDING COMPETITONS FOR SENDING REQUESTS
N/A
WIN
WIN
WIN
WIN
LOSE
REQUESTS:
382
392
IN-ZEST COMPETITONS FOR GRANT
WIN
WIN
LOSE
WIN
N/A
GRANTS:
GTSa.5
GTSa.4
386
GTSa.2
383
381
VOQ-3.5
P3 .57
P3 .56
P3 .55
P3 .54
P3 .53
P3 .52
P3 .51
OH .57
OH .56
OH .55
OH .54
OH .53
OH .52
OH .51
380
GTS -b.2
384
TO ZEST-7
GTS -b.4
385 ZCell
DISPATCHES:
TO ZEST-10
GTS -b.5
387 ZCell
TO ZEST-16
389 ZCell

Fig. 4

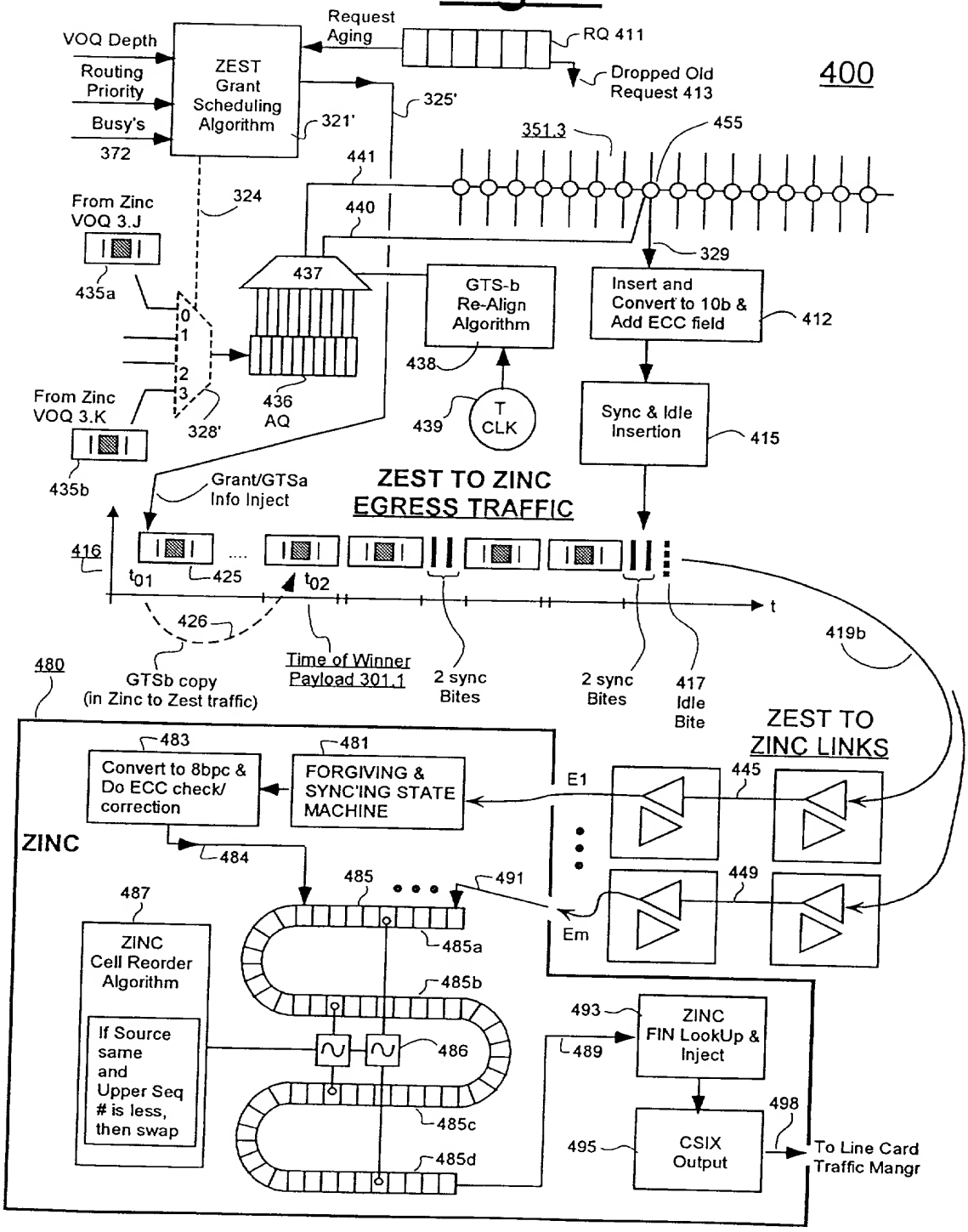
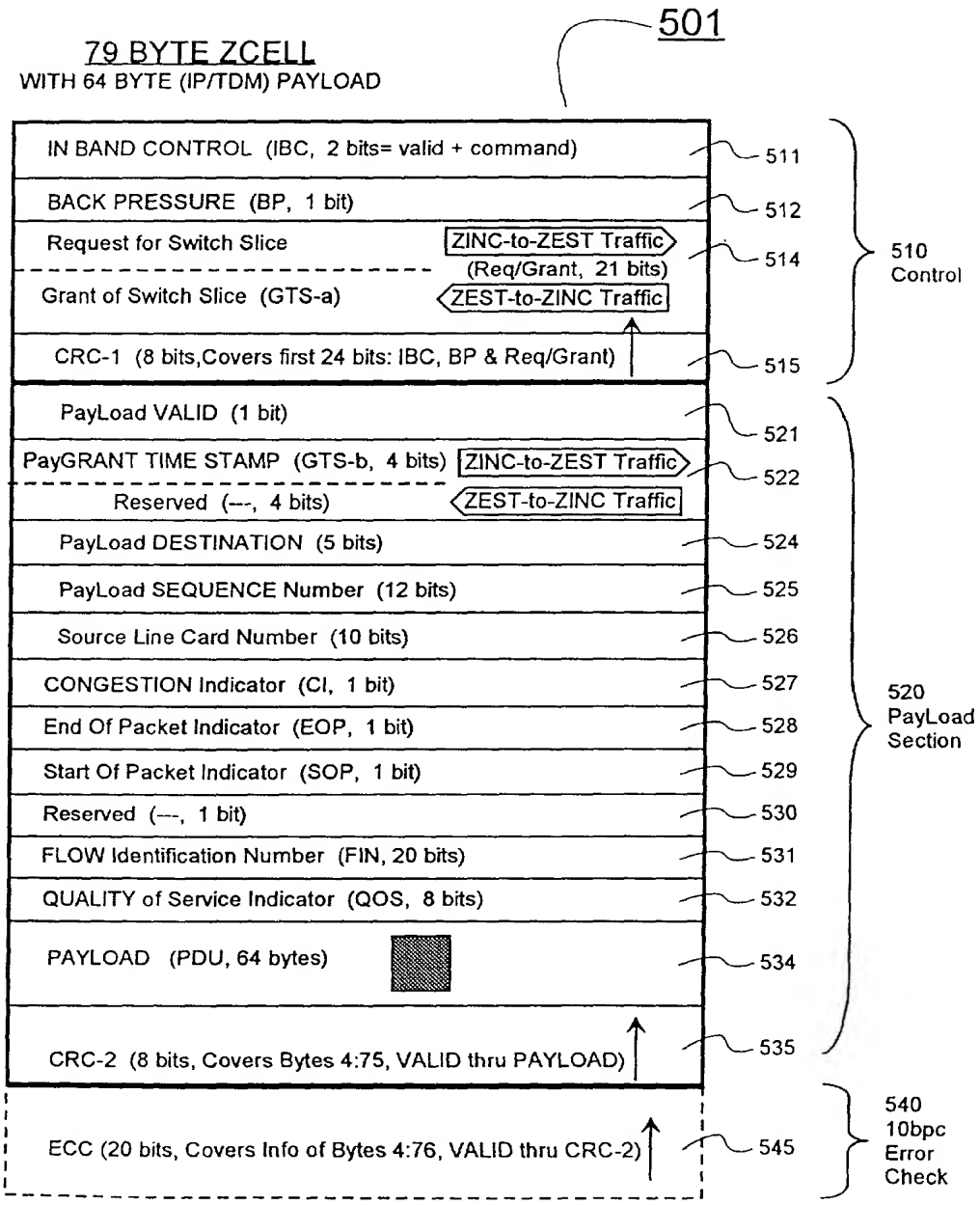

400
VOQ Depth
Routing Priority
Busy's
372
ZEST Grant Scheduling Algorithm
321'
Request Aging
RQ 411
Dropped Old Request 413
325'
351.3
455
441
324
440
From Zinc VOQ 3.J
435a
437
GTS-b Re-Align Algorithm
438
Insert and Convert to 10b & Add ECC field
412
329
From Zinc VOQ 3.K
435b
436 AQ
328'
439
T CLK
Sync & Idle Insertion
415
Grant/GTSa Info Inject
ZEST TO ZINC EGRESS TRAFFIC
416
425
t01
t02
t
426
419b
480
GTSb copy (in Zinc to Zest traffic)
Time of Winner Payload 301.1
2 sync Bites
2 sync Bites
417 Idle Bite
ZEST TO ZINC LINKS
483
Convert to 8bpc & Do ECC check/ correction
481
FORGIVING & SYNC'ING STATE MACHINE
E1
445
ZINC
484
485
491
449
487
ZINC Cell Reorder Algorithm
If Source same and Upper Seq # is less, then swap
485a
485b
486
485c
485d
Em
493
ZINC FIN LookUp & Inject
489
498
495
CSIX Output
To Line Card Traffic Mangr

Fig. 5A

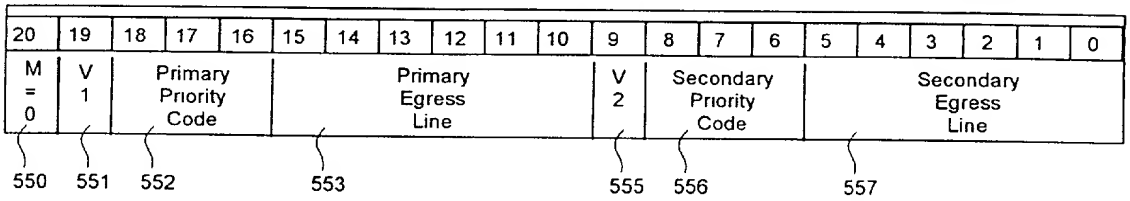

501
79 BYTE ZCELL
WITH 64 BYTE (IP/TDM) PAYLOAD
IN BAND CONTROL (IBC, 2 bits= valid + command)
511
BACK PRESSURE (BP, 1 bit)
512
Request for Switch Slice
ZINC-to-ZEST Traffic
(Req/Grant, 21 bits)
514
Grant of Switch Slice (GTS-a)
ZEST-to-ZINC Traffic
CRC-1 (8 bits,Covers first 24 bits: IBC, BP & Req/Grant)
515
510
Control
PayLoad VALID (1 bit)
521
PayGRANT TIME STAMP (GTS-b, 4 bits)
ZINC-to-ZEST Traffic
522
Reserved (---, 4 bits)
ZEST-to-ZINC Traffic
PayLoad DESTINATION (5 bits)
524
PayLoad SEQUENCE Number (12 bits)
525
Source Line Card Number (10 bits)
526
CONGESTION Indicator (CI, 1 bit)
527
End Of Packet Indicator (EOP, 1 bit)
528
Start Of Packet Indicator (SOP, 1 bit)
529
Reserved (---, 1 bit)
530
FLOW Identification Number (FIN, 20 bits)
531
QUALITY of Service Indicator (QOS, 8 bits)
532
PAYLOAD (PDU, 64 bytes)
534
CRC-2 (8 bits, Covers Bytes 4:75, VALID thru PAYLOAD)
535
520
PayLoad
Section
ECC (20 bits, Covers Info of Bytes 4:76, VALID thru CRC-2)
545
540
10bpc
Error
Check

ZINC-to-ZEST Traffic

21-bit UNICAST REQUEST FIELD

Fig. 5B

514B

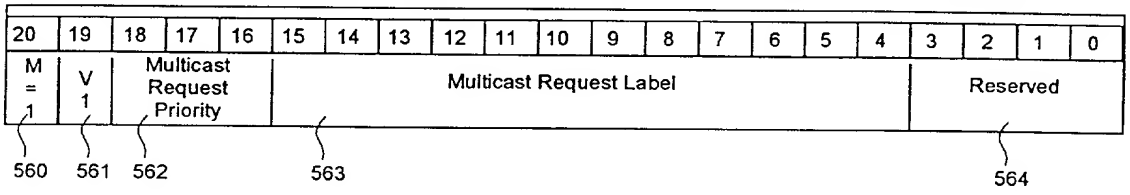


ZINC-to-ZEST Traffic

21-bit MULTICAST REQUEST FIELD

Fig. 5C

514C

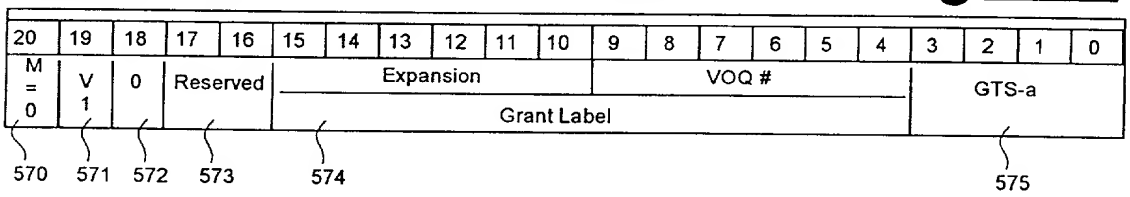


ZEST-to-ZINC Traffic

21-bit NonTDM Unicast GRANT FIELD

514D

Fig. 5D

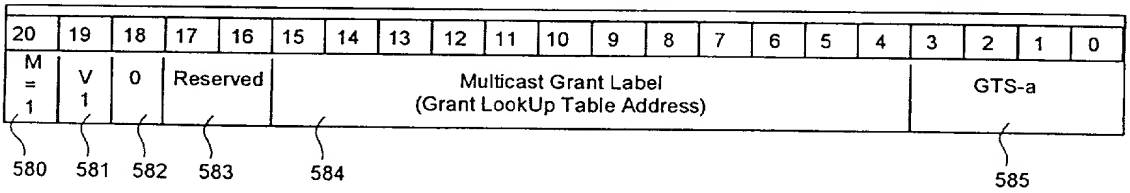


ZEST-to-ZINC Traffic

21-bit NonTDM Multicast GRANT FIELD

514E

Fig. 5E



ZEST-to-ZINC Traffic

21-bit TDM GRANT FIELD

514F

Fig. 5F

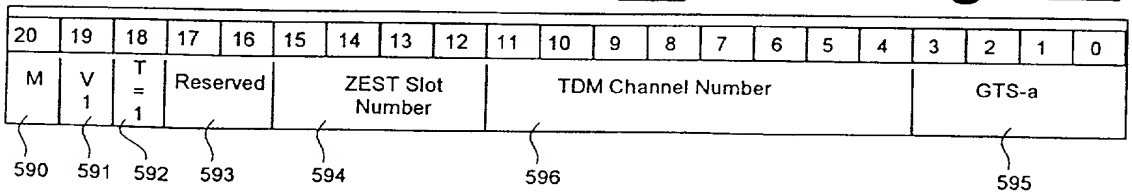
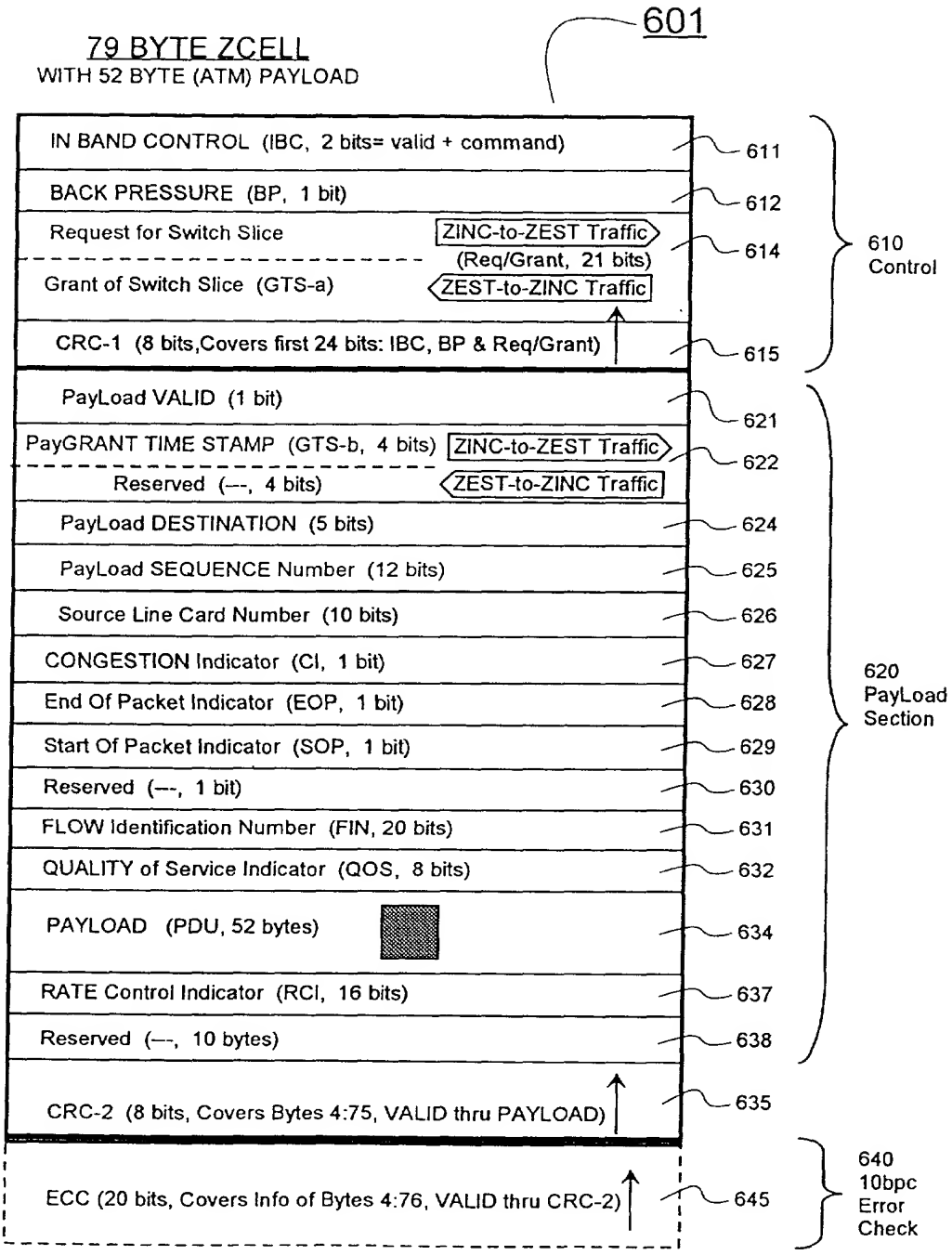
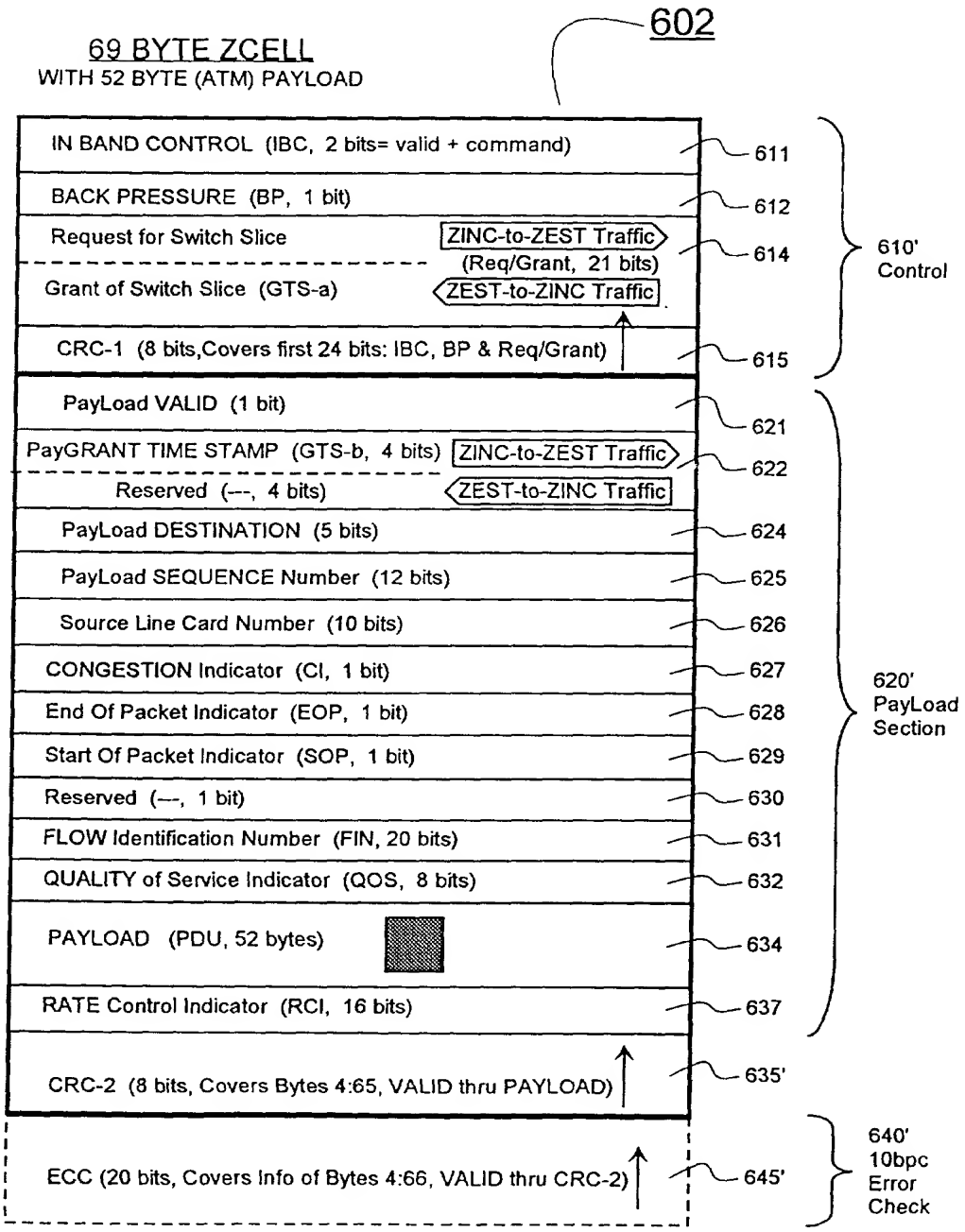


Fig. 6A



PD-03-2474-0GGG

Fig. 6B


602
69 BYTE ZCELL
WITH 52 BYTE (ATM) PAYLOAD
IN BAND CONTROL (IBC, 2 bits= valid + command)
611
BACK PRESSURE (BP, 1 bit)
612
Request for Switch Slice
ZINC-to-ZEST Traffic
(Req/Grant, 21 bits)
614
Grant of Switch Slice (GTS-a)
ZEST-to-ZINC Traffic
CRC-1 (8 bits,Covers first 24 bits: IBC, BP & Req/Grant)
615
610'
Control
PayLoad VALID (1 bit)
621
PayGRANT TIME STAMP (GTS-b, 4 bits)
ZINC-to-ZEST Traffic
622
Reserved (---, 4 bits)
ZEST-to-ZINC Traffic
PayLoad DESTINATION (5 bits)
624
PayLoad SEQUENCE Number (12 bits)
625
Source Line Card Number (10 bits)
626
CONGESTION Indicator (CI, 1 bit)
627
End Of Packet Indicator (EOP, 1 bit)
628
Start Of Packet Indicator (SOP, 1 bit)
629
Reserved (---, 1 bit)
630
FLOW Identification Number (FIN, 20 bits)
631
QUALITY of Service Indicator (QOS, 8 bits)
632
PAYLOAD (PDU, 52 bytes)
634
RATE Control Indicator (RCI, 16 bits)
637
620'
PayLoad
Section
CRC-2 (8 bits, Covers Bytes 4:65, VALID thru PAYLOAD)
635'
ECC (20 bits, Covers Info of Bytes 4:66, VALID thru CRC-2)
645'
640'
10bpc
Error
Check

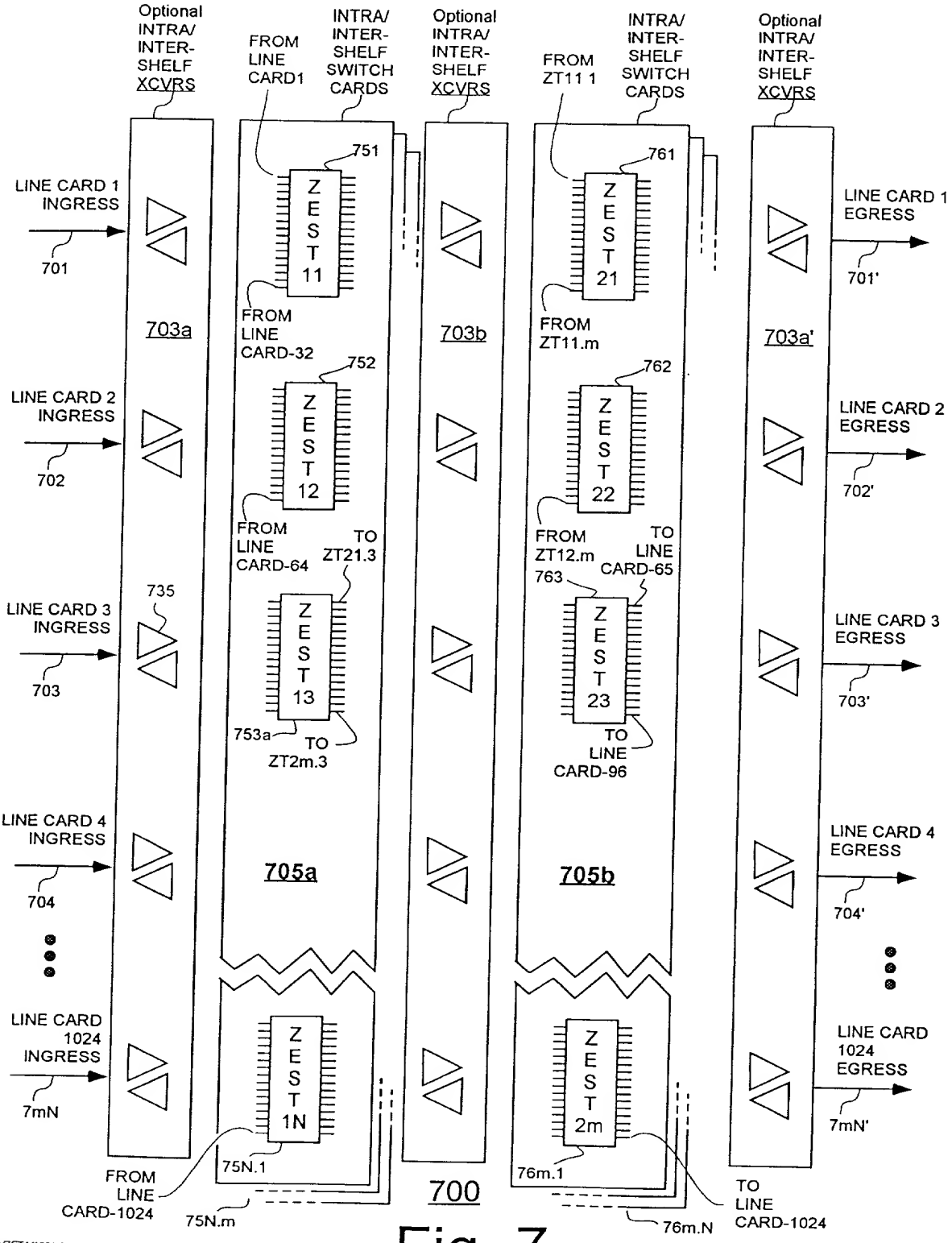


Fig. 7

999/ZETA/1001 007 cv5
Title 1
ver 1/10/2001 pm 12 45